

1 WHAT IS CLAIMED IS:

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3 1. A semiconductor current detector of improved noise immuni-  
4 ty for detecting or measuring an electric current, comprising:

5 (a) a semiconductor substrate having a Hall-effect device formed  
6 therein from one surface thereof, the Hall-effect device  
7 having a plurality of semiconductor regions including a pri-  
8 mary working region for generating a Hall voltage propor-  
9 tional to the magnitude of a current to be detected or  
10 measured;

11 (b) insulating means formed on said one surface of the semiconduc-  
12 tor substrate;

13 (c) a shielding layer formed in the insulating means for shielding the  
14 Hall-effect device from external disturbances; and

15 (d) a conductor strip formed in the insulating means so as to extend  
16 around at least part of the primary working region of the  
17 Hall-effect device, for carrying at least a prescribed frac-  
18 tion of the current to be translated into the Hall voltage  
19 by the Hall-effect device.

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21 2. The semiconductor current detector of claim 1 wherein the  
22 conductor strip surrounds at least about three quarters of the primary  
23 working region of the Hall-effect device.

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25 3. A semiconductor current detector of improved noise immuni-  
26 ty for detecting or measuring an electric current, comprising:

27 (a) a semiconductor substrate having a Hall-effect device formed  
28 therein from one surface thereof, the Hall-effect device  
29 having a plurality of semiconductor regions including a pri-  
30 mary working region for generating a voltage proportional  
31 to the magnitude of a current to be detected or measured;

32 (b) a first insulating layer formed on said one surface of the semi-  
33 conductor substrate so as to cover the Hall-effect device;

34 (c) a plurality of electrodes formed on the first insulating layer and  
35 electrically connected respectively to some of the semicon-  
36 ductor regions of the Hall-effect device through windows in

- 1 the first insulating layer;
- 2 (d) a plurality of conductor strips formed on the first insulating layer  
3 and electrically connected respectively to the electrodes;
- 4 (e) a second insulating layer formed on the first insulating layer and  
5 covering the electrodes and the conductor strips;
- 6 (f) a shielding layer formed on part of the second insulating layer so  
7 as to cover at least part of the primary working region of  
8 the Hall-effect device;
- 9 (g) a third insulating layer formed on the second insulating layer and  
10 covering the shielding layer; and
- 11 (h) a conductor strip formed on the third insulating layer so as to  
12 extend around at least part of the primary working region  
13 of the Hall-effect device, for carrying at least a prescribed  
14 fraction of the current to be detected or measured.

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16 4. The semiconductor current detector of claim 3 further com-  
17 prising:

- 18 (a) a fourth insulating layer formed on the third insulating layer and  
19 covering the conductor strip; and
- 20 (b) a second shielding layer formed on the fourth insulating layer so  
21 as to cover at least part of the primary working region of  
22 the Hall-effect device.

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24 5. The semiconductor current detector of claim 3 further com-  
25 prising a magnetic collector formed on the third insulating layer.

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27 6. A semiconductor current detector of improved noise immuni-  
28 ty for detecting or measuring an electric current, comprising:

- 29 (a) a semiconductor substrate having a Hall-effect device formed  
30 therein from one surface thereof, the Hall-effect device  
31 having a plurality of semiconductor regions including a pri-  
32 mary working region for generating a voltage proportional  
33 to the magnitude of a current to be detected or measured;
- 34 (b) a first insulating layer formed on said one surface of the semi-  
35 conductor substrate so as to cover the Hall-effect device;
- 36 (c) a plurality of electrodes formed on the first insulating layer and

- 1            electrically connected respectively to some of the semicon-  
2            ductor regions of the Hall-effect device through windows in  
3            the first insulating layer;
- 4            (d) a plurality of conductor strips formed on the first insulating layer  
5            and electrically connected respectively to the electrodes;
- 6            (e) a second insulating layer formed on the first insulating layer and  
7            covering the electrodes and the conductor strips;
- 8            (f) a conductor strip formed on the second insulating layer so as to  
9            extend around at least part of the primary working region  
10           of the Hall-effect device, for carrying at least a prescribed  
11           fraction of the current to be detected or measured;
- 12           (g) a third insulating layer formed on the second insulating layer and  
13           covering the conductor strip; and
- 14           (h) a shielding layer formed on the third insulating layer so as to  
15           cover at least part of the primary working part of the  
16           Hall-effect device.

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18           7.        The semiconductor current detector of claim 6 further com-  
19           prising a magnetic collector formed on the shielding layer .  
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